

NEW RECORDS AND AN UPDATED CHECKLIST OF HERPETOFAUNA FROM PHU THO PROVINCE, NORTHERN VIETNAM

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SUMMARY

Xuan Son National Park (NP) is located at Thanh Son district, Phu Tho province with a total core area of 15,048 ha. On the basis of the recent field surveys conducted during April to October, 2019 in Xuan Son National Park (Tan Son district), Phu Tho province, Vietnam, combining newly collected specimens of this study with species previous notes, the herpetological list gives an updated herpetological list of 130 species of the herpetofauna from Phu Tho province, Northern Vietnam, including 44 species of amphibians (8 families, 3 order), 10 species of turtles, 23 species of lizards, and 51 species of snakes (17 families, 2 orders). One species of amphibians (Ranidae: Chapa Torrent Frog *Odorrana chapaensis*) and three species of snakes (Colubridae: Sapa Flat-nosed Snake *Hebius chapaensis*, Light-barred Kukri Snake *Oligodon albocinctus* and Striped Kukri Snake *Oligodon taeniatus*) were recorded for the first time for herpetofauna from Phu Tho province. Based on the new herpetological collection from this province we provide the descriptions of morphology and information on the distribution of new herpetofauna by different habitat types to the fauna. The herpetofauna of Phu Tho province contains a high level of conservation concern, of which, 22 in Red Data Book of Vietnam (04 CR, 10 EN, 08VU), 22 species listed in the IUCN Red List (06 CR, 03 EN, 08 VU, 05 NT), 05 species listed IA in Governmental Decree 64/2019/ND-CP, 5 species listed in IB and 12 species listed in IB in Governmental Decree 84/2021/ND-CP. In addition, an updated list of the local herpetofauna is provided, including recent taxonomic or nomenclatural changes.

Keywords: Herpetofauna, new records, Phu Tho province, species composition.

1. INTRODUCTION

Xuan Son National Park (NP) is located in the Phu Tho province in Northern Vietnam is notable for its high plant and animal diversity with covering an area of 15.048 hectares of montane evergreen forest. The province contains a large area of 440,000 hectares of natural forest (Forest Protection Department, 2020). Although this protected area was established in 2002, the herpetofauna of Xuan Son NP is still poorly studied. Tran et al. (2008) provided the first list of 27 amphibians species from this reserve, Nguyen et al. (2009) reported a total of 29 species of amphibians from Xuan Son NP, Nguyen et al. (2013) could increase the amphibian list for Xuan Son NP to a total of 40 species. Vassiliev A A. B. 2015 recorded 47 species of herpetofauna from Xuan Son NP. Tran and Le, 2019; Tran Thanh Tung, 2020, subsequently documented 50 species of herpetofauna from this nature reserve including

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four new provincial records for Xuan Son NP.

In this paper, based on our recent fieldwork in Xuan Son NP in 2019, we report one species amphibians and three species reptile's additional species new records and an updated checklist of herpetofauna from Phu Tho province.

2. RESEARCH METHODOLOGY

Sampling: Field surveys were conducted by N.H. Nguyen, T.T. Tran in April, May and October 2019 in Xuan Son National Park, Phu Tho province. The coordinates (WGS 84) were determined by using the GPS Garmin ver. 60CX. Specimens were collected between 19:00 and 24:00 hours. After photographing in life, specimens were euthanized in a closed vessel with a piece of cotton wool containing ethyl acetate (Simmons 2002), fixed in 80% ethanol for five hours, and then later transferred to 70% ethanol for permanent storage. Tissue samples (muscles from thigh) were preserved separately in 70% ethanol prior to fixation.

Specimens were collected between 19:00 and 24:00h. Specimens were deposited in the collections of the Hanoi National University of Education (HNUE).

Morphological characteristics of amphibians: Measurements were taken on preserved specimens with digital calipers to the nearest 0.1 mm. The following abbreviations were used: SVL= snout vent length, HL = head length (from the back of mandible to tip of snout), HW = maximum head width (across angles of jaws), NS= distance from nostril to the tip of snout, EN = distance from anterior corner of orbit to the nostril, IND = internarial distance, IOD = interorbital distance, ED = eye diameter, UEW = maximum width of upper eyelid, DAE = distance between anterior corners of orbits, MN = posteriormargin of mandible to nostril, MFE = posterior margin of mandible to anterior corner of orbit, MBE = posterior margin of mandible to posterior corner of orbit; DPE = distance between posterior corners of orbits, TYD = tympanum diameter, TYE = distance from anterior margin of tympanum to posterior corner of orbit, FLL = forearm length (from elbow to base of outer palmar tubercle), HAL = hand length (from base of outer palmar tubercle to tip of third finger), FL1–4 = Finger length I–IV, OPT = outer palmar tubercle length, IPT = inner palmar tubercle length, NPL = nuptial pad length, FeL = femur length (from vent to knee), TbL= tibia length (from knee to tarsus), TbW = maximum tibia width, FoL = foot length (from tarsus to the tip of fourth toe), TL1–5 = toe length I–V, IMT = inner metatarsal tubercle length. For the webbing formula, we followed Glaw and Vences (2007). Sex was determined by examination of the presence of nuptial pads and gonadal inspection.

Morphological characteristics snakes: SVL = Longitudinal body (from the muzzle to the cleft); Tal = long tail (from the vent to tail tip); C = body scales; ASR = number of scales

in the neck, MSR = in the middle of the body and PSR = in the front of the cleft; sm = smooth scaly body or kl = with the ridge. Counting: in oblique or staggered, if the scales are larger than the scales on the side, count V-shape. VEN = Number of scales, SC = scales under the tail divided (d1) or not divided (d0); CL scales in front of the grave (1 scales or 2 scales); LR = number of cheek scales; SL = Upper scleral, l = left scapular contact luster, r = right lobe scales, m = largest scales; IL = lower lip scales, s = lower scales in contact with chin scales I; PreOc = preopercle and PostOc = postoperative scales. Identification of sex was made by inspection of presence of hemipenes.

Specimen identification: For taxonomic identification, we referred to Bourret (1942), Bain et al. (2009), Le et al. (2018), David et al. (2021), Smith (1943), Teynié et al. (2007) and David et al. (2008, 2011). Species names follow Nguyen et al. (2009), Frost (2022), and Uetz et al. (2022).

3. RESULTS AND DISCUSSION

3.1. Current list of herpetofauna species known from Phu Tho province

Based on our recent herpetological surveys we can add one newly recorded species of amphibians (Ranidae: Chapa Torrent Frog *Odorrana chapaensis*) and three species of snakes (Colubridae: Sapa Flat-nosed Snake *Hebius chapaensis*, Light-barred Kukri Snake *Oligodon albocinctus* and Striped Kukri Snake *Oligodon taeniatus*) to the herpetofaunal list of Phu Tho. Together with recently published new species records and species descriptions, the herpetofauna of Phu Tho currently comprises 44 species of amphibians and 51 species of reptiles (see Tables 1). 22 in Red Data Book of Vietnam (04 CR, 10 EN, 08VU), 22 species listed in the IUCN Red List (06 CR, 03 EN, 08 VU, 05 NT), 05 species listed IA in Governmental Decree 64/2019/ND-CP, 5 species listed in IB and 12 species listed in IB in Governmental Decree 84/2021/ND-CP.

Table 1. Checklist of amphibia species record from Phu Tho province, Vietnam

Number	Taxa	Previous Record	Status			
			SDVN (2007)	IUCN (2022)	Decree 64/ (2019)	Decree 84/ (2021)
AMPHIBIA						
ANURA						
I. Bufonidae						
1	<i>Duttaphrynus melanostictus</i> (Schneider, 1799)	1,2,3,4,5				
II. Megophryidae						
2	<i>Leptobranchella. cf. bourreti</i> Dubois, 1983	5				
3	<i>L. sungi</i> (Lathrop, Murphy, Orlov & Ho, 1998)	4				
4	<i>L. ventripunctata</i> (Fei, Ye & Li, 1990)	3,8				
5	<i>Ophryophryne microstoma</i> Boulenger, 1903	3,8				
6	<i>Xenophrys major</i> (Boulenger, 1908)	1,3,4,8				
7	<i>X. pachyproctus</i> (Huang, 1981)	4,5				
II. Microhylidae						
8	<i>Kaloula pulchra</i> Gray, 1841	1,2				
9	<i>Kalophrynus interlineatus</i> (Blyth, 1855)	2				
10	<i>Microhyla butleri</i> Boulenger, 1900	1,2,5				
11	<i>M. fissipes</i> Boulenger, 1884	2,5				
12	<i>M. heymonsi</i> Vogt, 1911	1,2,3,5				
13	<i>M. pulchra</i> (Hallowell, 1861)	1,2				
IV. Dicroglossidae						
14	<i>Fejervarya limnocharis</i> (Gravenhorst, 1829)	1,2,4,5				
15	<i>Hoplobatrachus rugulosus</i> (Wiegmann, 1834)	1,2,5				
16	<i>Limnonectes bannaensis</i> Ye, Fei & Jiang, 2007	1,2,3,4,5,8				
17	<i>Quasipaa verrucospinosa</i> (Bourret, 1937)	1,2,4,8			NT	
18	<i>Occidozyga laevis</i> (Günther, 1858)	1				
19	<i>O. lima</i> (Gravenhorst, 1829)	1,2,8				
V. Ranidae						
20	<i>Amolops ricketti</i> (Boulenger, 1899)	3,4,5				
21	<i>Hylarana macrodactyla</i> Günther, 1858	1,2				
22	<i>H. taipehensis</i> (Van Denburgh, 1909)	1,2				
23	<i>Odorrana chapaensis</i> (Bourret, 1947)*	8			NT	
24	<i>O. chloronota</i> (Günther, 1876)	2				
25	<i>O. graminea</i> (Boulenger, 1900)	3,4,8				
26	<i>O. yunnanensis</i> (Anderson, 1879 "1878")	1	VU			
27	<i>Sylvirana guentheri</i> (Boulenger, 1882)	1,2,5,8				
28	<i>S. maosonensis</i> (Bourret, 1947)	1,3,4,8				
29	<i>S. nigrovittata</i> (Blyth, 1856)	1,2				
30	<i>Rana johnsi</i> Smith, 1921	1,2,3,4,5,8				
VI. Rhacophoridae						
31	<i>Kurixalus bisacculus</i> (Taylor, 1962)	3,6,8				
32	<i>K. odontotarsus</i> (Ye & Fei, 1993)	5				
33	<i>Polypedates megacephalus</i> Hallowell, 1861	3,5, 6				
34	<i>P. mutus</i> (Smith, 1940)	3,4,6				
35	<i>Rhacophorus kio</i> Ohler & Delorme, 2006	5,6,8	EN			
36	<i>R. rhodopus</i> Liu and Hu, 1959	6				
37	<i>R. orlovi</i> Ziegler & Köhler, 2001	5,8				
38	<i>Rohanixalus vittatus</i> (Boulenger, 1887)	1,2,5,6				

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Number	Taxa	Previous Record	Status			
			SDVN (2007)	IUCN (2022)	Decree 64/ (2019)	Decree 84/ (2021)
39	<i>Zhangixalus dennysi</i> (Blanford, 1881)	4,5, 6,8				
40	<i>Z. smaragdinus</i> (Blyth, 1852)	3,6				
41	<i>Theلودerma albopunctatum</i> (Liu and Hu, 1962)	1,2,6,8				
42	<i>T. corticlae</i> (Boulenger, 1904)	4,6	EN			
CAUDATA						
VII. Salamandridae						
43	<i>Tylototriton pasmansii</i> Bernardes, Le, Nguyen, Pham, Pham, Nguyen, and Ziegler, 2020	2		VU		IIB
GYMNOPHIONA						
VIII. Ichthyophiidae						
44	<i>Ichthyophis kohtaoensis</i> Taylor, 1960	2		VU		
B	REPTILIA					
SQUAMATA						
I. Agamidae						
45	<i>Acanthosaura lepidogaster</i> (Cuvier, 1829)	1,4,5,7,8				
46	<i>Calotes emma</i> Gray, 1845	7				
47	<i>C. versicolor</i> (Daudin, 1802)	1,7				
48	<i>Draco maculatus</i> (Gray, 1845)	1,5,7				
49	<i>Pseudocalotes microlepis</i> (Boulenger, 1887)	5				
50	<i>Physignathus cocincinus</i> Cuvier, 1829	1,7	VU	VU		
II. Gekkonidae						
51	<i>Gekko gecko</i> (Linnaeus, 1758)	1,2,7	VU			IIB
52	<i>Hemidactylus frenatus</i> Duméril & Bibron, 1846	1,2,7				
II. Lacertidae						
53	<i>Takydromus sexlineatus</i> Daudin, 1802	1,2,4,7				
III. Scincidae						
54	<i>Eutropis chapaensis</i> (Bourret, 1947)	1,2,5,7				
55	<i>E. longicaudata</i> (Hallowell, 1857)	1,2,5,7,8				
56	<i>E. macularia</i> (Blyth, 1854)	7				
57	<i>E. multifasciata</i> (Kuhl, 1820)	7				
58	<i>Lipinia vittigera</i> (Boulenger, 1894)	5				
59	<i>Plestiodon chinensis</i> (Gray, 1848)	1,2				
60	<i>P. tamdaoensis</i> (Bourret, 1937)	5				
61	<i>P. quadrilineatus</i> (Blyth, 1854)	1,7				
62	<i>Scincella reevesii</i> (Gray, 1848)	1				
63	<i>Sphenomorphus cryptotis</i> Darevsky, Orlov & Ho, 2004	4				
64	<i>S. indicus</i> (Gray, 1854)	5,7				
65	<i>Tropidophorus baviensis</i> Bourret, 1949	7				
66	<i>T. hainanus</i> Smith, 1924	1,2,5,7				
IV. Varanidae						
67	<i>Varanus salvator</i> (Laurenti, 1786)	1,7	EN	LC/NT		IIB
V. Typhlopidae						
68	<i>Indotyphlops braminus</i> (Daudin, 1804)	1,7				
VI. Boidae						
69	<i>Python molurus</i> (Linnaeus, 1758)	1,2,7	CR	NT/VU		IIB
VII. Xenopeltidae						

Number	Taxa	Previous Record	Status			
			SDVN (2007)	IUCN (2022)	Decree 64/ (2019)	Decree 84/ (2021)
70	<i>Xenopeltis unicolor</i> Reinwardt, 1827	7				
VIII. Xenodermidae						
71	<i>Achalinus rufescens</i> Boulenger, 1888	7				
IX. Colubridae						
72	<i>Ahaetulla prasina</i> (Reinhardt, 1827)	1,7				
73	<i>Amphiesma stolatum</i> (Linnaeus, 1758)	1,2,7				
74	<i>Boiga guangxiensis</i> Wen, 1998	5,7,8				
75	<i>B. multomaculata</i> (Reinwardt, Boie, 1827)	7				
76	<i>Calamaria septentrionalis</i> Boulenger, 1890	7				
77	<i>C. cf. pavimentata</i> Duméril, Bibron & Duméril, 1854	5				
78	<i>Coelognathus radiatus</i> (Boie, 1827)	1,2,7	VU			
79	<i>Dendrelaphis pictus</i> (Gmelin, 1789)	1,2,7				
80	<i>Elaphe moellendorffi</i> (Boettger, 1886)	1	VU	VU		
81	<i>E. taeniura</i> (Cope, 1861)	1,7		VU		
82	<i>Fowlea flavipunctatus</i> (Halowell, 1861)	2,4,7				
83	<i>Fowlea piscator</i> (Schneider, 1799)	1				
84	<i>Hebius chapaensis</i> (Bourret, 1934)*	8				
85	<i>H. craspedogaster</i> (Bouleger, 1899)	5				
86	<i>H. khasiense</i> (Bouleger, 1890)	4				
87	<i>H. modestus</i> (Gunther, 1875)	5,7				
88	<i>Lycodon meridionale</i> (Bourret, 1945)	7				
89	<i>L. ruhstrati</i> (Fischer, 1886)	5,8				
90	<i>Oligodon chinensis</i> (Gunther, 1888)	1,5,7				
91	<i>O. albocinctus</i> (Cantor, 1849)*	8				
92	<i>O. cinereus</i> (Gunther, 1864)	2,4,7				
93	<i>O. cyclurus</i> (Cantor, 1849)	1,7				
94	<i>O. lacroixi</i> Angel & Bourret, 1933	5				
95	<i>O. taeniatus</i> (Günther, 1861)*	8				
96	<i>Opisthotropis lateralis</i> Boulenger, 1904	1,4,7				
97	<i>Oreocryptophis porphyraceus</i> (Cantor, 1849)	4				
98	<i>Pseudoxenodon bambusicola</i> Vogt, 1922	2,7				
99	<i>Ptyas korros</i> (Schlegel, 1847)	1,2,4,7	EN	NT		
100	<i>P. mucosa</i> (Linnaeus, 1758)	1,2,7	EN			IIB
101	<i>P. multicinctus</i> (Roux, 1907)	5,7				
102	<i>Rhabdophis subminiatus</i> (Schlegel, 1847)	1,2,7				
103	<i>R. chrysargus</i> (Schlegel, 1847)	7				
104	<i>Sibynophis chinensis</i> (Gunther, 1889)	1,7				
105	<i>Sinonatrix aequifasciata</i> (Barbour, 1908)	7				
106	<i>Trimerodytes percarinatus</i> (Boulenger, 1899)	1,2,4,7				
X. Elapidae						
107	<i>Bungarus fasciatus</i> (Schneider, 1801)	1,7	EN			
108	<i>B. multicinctus</i> Blyth, 1861	1,5,7				
109	<i>Naja atra</i> Cantor, 1842	2,7	EN	VU	IA	IIB
110	<i>Ophiophagus hannah</i> (Cantor, 1846)	1,2,7	CR	VU		IB
111	<i>Sinomicrurus macclellandi</i> (Reinhardt, 1844)	2,5,7				
XI. Viperidae						
112	<i>Protobothrops mucrosquamatus</i> (Cantor, 1849)	4,5,7				

Number	Taxa	Previous Record	Status			
			SDVN (2007)	IUCN (2022)	Decree 64/ (2019)	Decree 84/ (2021)
113	<i>Trimeresurus albolabris</i> Gray, 1842	1,7				
114	<i>T. stejnegeri</i> Schmidt, 1925	5				
XII. Homalopsidae						
115	<i>Hypsiglossus plumbea</i> (Boie, 1827)	1,2,7				
116	<i>Myrophis chinensis</i> (Gray, 18/2)	7				
XIII. Pseudaspidae						
117	<i>Psammodynastes pulverulentus</i> (Boie, 1827)	7				
XIV. Pareatidae						
118	<i>Pareas hamptoni</i> (Boulenger, 1905)	7				
119	<i>P. monticola</i> (Cantor, 1839)	5				
TESTUDINATA						
XV. Platysternidae						
120	<i>Platysternon megacephalum</i> Gray, 1841	1,2,7	EN	CR	IA	IB
XVI. Geoemydidae						
121	<i>Cuora galbinifrons</i> Bourret, 1949	1,2	EN	CR	IA	IB
122	<i>C. mouhotii</i> (Gray, 1862)	1,2,7		EN		IIB
123	<i>Cyclemys dentata</i> (Gray, 1841)	2		NT		IIB
124	<i>Geoemyda spengleri</i> (Gmelin, 1789)	1,7		EN		IIB
125	<i>Mauremys sinensis</i> (Gray, 1834)	2	CR	CR	IA	IB
XVII. Testudinidae						
126	<i>Manouria impressa</i> ((Günther, 1882)	1,7	VU	EN		IIB
127	<i>Indotestudo elongata</i> (Blyth, 185/)	7	EN	CR		IIB
XVIII. Trionychidae						
128	<i>Palea steindachneri</i> (Siebenrock, 1906)	1,2	VU	CR		IIB
129	<i>Pelodiscus sinensis</i> Wiegmann, 1845	1,2,7		VU		
130	<i>Rafetus swinhoei</i> (Gray, 1873)	2	CR	CR	IA	IB

(* = new provincial records, 1 = Tran et al., 2008, 2 = Nguyen et al., 2009, 3 = Do et al., 2009, 4 = Nguyen et al., 2013, 5 = Vassiliev A A. B. 2015, 6 = Tran et al., 2019, 7 = Tran Thanh Tung 2020, 8 = This study)

3.2. Taxonomical accounts

Family Ranidae

Odorrana chapaensis (Bourret, 1937)

Chapa Torrent Frog/Vietnam Sucker Frog

Specimens examined (n = 14). 11 adult males (TN.2019.11-21) and three adult females (TN.2019.22-24) collected by N.H. Nguyen, T.T. Tran on 30 April and 1 May 2019 near Lang village within Xuan Son National Park (21°06'29''N, 104°57'42''E; at an elevation of 850 m asl.).

Description: Morphological characters of the specimen from Xuan Son NP agreed with the description of Bourret (1942) and Bain et al. (2009): Size large (SVL 46.9–79.0 mm in males, SVL 86.3–93.6 mm in females). Head longer than wide (HL 16–28.1 mm, HW 15.5–

24.6 mm, HL/SVL 0.3–0.4 in males and HL 30.1–33.9 mm, HW 27.5–28.9 mm, HL/SVL 0.35–0.38 in females); snout round (SL 6–12.5 mm, SL/SVL 0.14–0.16 in males and SL 12.3–13.6 mm, SL/SVL 0.13–0.16 in females); tympanum distinct; vomerine teeth present; tongue notched posteriorly; external vocal sacs present, paired gular pouches.

Forelimb moderately slender (FLL 8.7–20.2 mm, FLL/SVL 0.21–0.25 in males and FLL 20.8–22.3 mm FLL/SVL 0.22–0.24 females); relative finger lengths: II<I<IV<III; fingers free of webbing; tips of fingers expanded into discs, with circummarginal grooves, width of finger III disc > 2 times of the width of phalanges and larger than tympanum diameter. Hindlimbs slender (FL 21.8–42.5 mm, TL 24.3–46.6 mm,

FL/SVL 0.51–0.56, FL/TL 0.88–1.0 in males and FL 48.8–51.3 mm, TL 50.9–54.7 mm, FL/SVL 0.54, FL/TL 0.94 in females) in tips of toes expanded into discs, with circummarginal grooves; width of toe IV disc > 2 times of the width of phalanges, narrower than width of finger III disc; relative length of toes: I<II<III<V<IV; fully webbed; tibio-tarsal articulation reaching well beyond snout.

Skin: Dorsal surface of head, body and upper part of flanks smooth; supratympanic fold distinct; dorsolateral fold absent; lower part of flanks with small tubercles; ventral surface smooth.

Coloration in life: Dorsal skin brown; sides of head and flanks with black spots, green outline; hindlimbs with distinct dark bars; webbing grey; ventral surface yellow-white with brown marbling, anterior portion of ventral thighs white with dark grey spots, posterior portion dark grey.

Ecology notes: Specimens were found on the rock between 19:30 and 22h30 hours in rocky streams. The surrounding habitat was mixed evergreen forest of small to medium hardwoods and shrubs. The air temperature was 25–30°C and the relative humidity measured 65–80%.

Distribution: In Vietnam, this species has been recorded from Dien Bien, Lai Chau, and Lao Cai provinces (Luong et al., 2019). This is the first record of *O. chapaensis* from Xuan Son National Park and from Phu Tho Province. Elsewhere, the species is known from China (Luong et al., 2019, Frost, 2022).

Family COLUBRIDAE

***Hebius chapaensis* (Bourret, 1934)**

Sapa Flat-nosed Snake

Specimens examined (n = 2). Two adult females (TN.2019.35-36), collected by N.H. Nguyen, T.T. Tran on 3 May 2019 near Coi Village within Xuan Son National Park (21°07'50''N, 104°57'21''E; at an elevation of 730 m asl.).

Description: Morphological characters of

the specimens from Xuan Son NP agreed with the description of Le et al. (2018), David et al. (2021): SVL 449-518 mm, TaL 147-178 mm (TaL/TL 0,25-0,28) ; head longer than wide (HL 16.7–20 mm, HW 9.2–13.5 mm), head distinct from the neck; pupil round; loreal 1/1, not touching the eye; preoculars 2/2; postoculars 2/2; anterior temporals 1/1, posterior temporals 2/2; supralabials 9/9, fifth to sixth in contact with the eye, eight largest; infralabials 10/10, first to fifth (both sides) bordering chin shields; dorsal scale rows 17–17–17, feebly keeled; scales of the outer row enlarged; ventrals 167-172; divided anal plate; subcaudals 83-107, divided.

Coloration in life: Dorsal surface of head, body and tail blackish grey, with two broader light yellow dorsolateral stripes along the body; ventral surface and lower surface of tail black.

Ecology notes: The specimens were found on the ground, between 20:00 and 22:00 in a rocky stream near Coi village. The surrounding habitat was mixed evergreen forest of small to medium hardwoods and shrubs. The air temperature was 27 - 29°C and the relative humidity measured 78 - 82%.

Distribution: In Vietnam, this species was reported from Lao Cai, Yen Bai, Cao Bang, Dien Bien, Son La, Thanh Hoa provinces and Ha Noi City (Uetz et al., 2022, Luu et al., 2020). This is the first record of *Hebius chapaensis* for Xuan Son National Park and for Phu Tho provinces. Elsewhere, the species is known from China (Uetz et al., 2022).

***Oligodon albocinctus* (Cantor, 1839)**

Light-barred Kukri Snake

Specimen examined (n = 1). one adult female (TN.2019.09), collected on 1 May 2019 near streams within Lang village in Xuan Son National Park, Phu Tho province (21°06'29''N, 104°57'42''E; at an elevation of 850 m asl.).

Description: Morphological characters of the specimen from Xuan Son NP agreed with the description of Smith (1943): Body was comparatively robust with SVL 720 mm, TaL

105 mm; Head elongated and slightly flattened, longer than wide (HL 22.3 mm, HW 16.3 mm) rather flattened; loreal 1/1; loreal not in contact with eye; supralabials 8/8, fourth to fifth in contact with the eye, seventh largest; infralabials 9/9, first to fourth bordering chin shields; preocular 1/1; postoculars 2/2; anterior temporals 1/1, posterior temporals 2/2; dorsal scale rows 17–17–15, keeled; ventrals 188; subcaudals 40, divided; cloacal single.

Coloration in life: The specimen was reddish–brown with 26 yellowish dorsal cross–bands on body and 7 cross–bands on its incomplete tail.

Ecology notes: The specimen was found at 22:00 hour, near a stream in Lang village. The surrounding habitat was mixed secondary forest of small to medium hardwoods and shrub. The air temperature was 26°C and the relative humidity measured 83%.

Distribution: In Vietnam, this species was previously known from Vinh Phuc provinces. This is the first record of *O. albocinctus* from Xuan Son National Park and from Phu Tho province. Elsewhere, this species is known from Nepal, Bangladesh, Bhutan, India, Myanmar, Southern China (Nguyen et al. 2009; Uetz et al. 2022)

***Oligodon taeniatus* (Günther, 1861)**

Striped Kukri Snake/Ran kiem vach

Specimen examined (n = 1). One adult female (TN.2019.73), collected on 2 October 2019 near Du village within Xuan Son National Park, Phu Tho province ((21°07'32''N, 104°57'42''E; at an elevation of 670m asl.).

Description: Morphological characters of the specimen from Xuan Son NP agreed with the description of Teynié et al. (2007) and David et al. (2008, 2011): A large size for the *O. taeniatus*-group, 328 mm in total length (SVL 296 mm, TaL 59 mm); body cylindrical; head indistinct from neck; eye small, pupil round; rostral distinctly broader than high, visible from above; dorsal scale rows 19–19–15, scales all smooth; loreal 1/1; loreal not in

contact with eye; supralabials 8/8, fourth to fifth in contact with the eye, seventh largest; anal plate single; infralabials 7/7, first to fifth bordering chin shields; anterior temporals 1/1, posterior temporals 2/2; ventrals 149; subcaudals 38, paired.

Coloration in life: Dorsal surface of head and body greyish-brown, with wide dark tan vertebral stripe, edged with irregular black dots forming on each side a dark dorsolateral line; head is brownish-gray, with a transversal darkbrown marking in front of eyes above; venter surface creamish-yellow with few subrectangular blotches in its anterior half, uniform towards its tip.

Ecology notes: The specimen was found at 21:30 hour, near a stream in Du village. The surrounding habitat was mixed secondary forest of small to medium hardwoods and shrub. The air temperature was 22°C and the relative humidity measured 82%.

Distribution: In Vietnam, this species was previously known from Ha Giang, Cao Bang, Vinh Phuc, Thai Nguyen, Hai Duong, Hoa Binh, Ninh Binh, Nghe An, Quang Binh, Lam Dong, Khanh Hoa, Dong Nai, Tay Ninh, Ba Ria - Vung Tau, Tien Giang, Soc Trang, Kien Giang provinces, and Ho Chi Minh City. This is the first record of *O. albocinctus* from Xuan Son National Park and from Phu Tho province. Elsewhere, this species is known from Thailand, Laos, and Cambodia (Nguyen et al., 2009; Uetz et al., 2022)

4. DISCUSSIONS

Our new records bring the total number of herpetofauna species to 130 in Phu Tho province (Table 1). Some taxonomic changes of amphibians were made by recent studies, for example, Nguyen et al. (2009) documented the distribution of *Leptobranchella pelodytoides* (Boulenger, 1893) from Lao Cai province in the North Southwards to Gia Lai province, however, Ohler et al. (2011) indicated that *L. pelodytoides* has a restricted distribution in Myanmar and records of *L. pelodytoides* in

Vietnam should be assigned to the *L. ventripunctata* (Fei, Ye & Li, 1990) group. Poyarkov et al., 2015 stated that the previous record of *Theloderma asperum* (Boulenger, 1886) in Vietnam (Nguyen et al., 2009) should be re-identified as *Theloderma albopunctatum* (Liu & Hu, 1962). Some species have been reported by others papers as *Leptobranchella firthi* (Rowley, Hoang, Dau, Le, and Cao, 2012), *Leptobranchium hasseltii* Tschudi, *Kalophrynus pleurostigma* Tschudi, *Limnonectes poilani* (Bourret), *Amolops spinaepectoralis* (Inger, Orlov & Darevsky), *Odorrana livida* (Blyth), *Odorrana orba* (Stuart & Bain), *Ichthyophis glutinosus* (Linnaeus), *Trimeresurus honsonensis* (Grismer, Ngo & Grismer) (Tran et al., 2008, Nguyen et al., 2014). These species are not distributed in Vietnam or Northern Vietnam.

5. CONCLUSION

We report one species of amphibians (Ranidae: Chapa Torrent Frog *Odorrana chapaensis*) and three species of snakes (Colubridae: Sapa Flat-nosed Snake *Hebius chapaensis*, Light-barred Kukri Snake *Oligodon albocinctus* and Striped Kukri Snake *Oligodon taeniatus*). In addition, we provide an updated list of 130 species of the herpetofauna (44 species of amphibians and 86 species of reptiles) from Phu Tho province, Northern Vietnam. The herpetofauna of Phu Tho contains some species of conservation concern with 22 in Red Data Book of Vietnam (04 CR, 10 EN, 08VU), 22 species listed in the IUCN Red List (06 CR, 03 EN, 08 VU, 05 NT), 05 species listed IA in Governmental Decree 64/2019/ND-CP, 5 species listed in IB and 12 species listed in IB in Governmental Decree 84/2021/ND-CP.

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REFERENCES

1. Bain, R. H., Stuart, B. L., Nguyen, T. Q., Che, J., & Rao, D. Q. (2009). A new *Odorrana* (Amphibia: Ranidae) from Vietnam and China. *Copeia*, 2009(2),

348-362.

2. Dang, N. T., Tran, K., Dang, H. H., Nguyen, C., Nguyen, N. T., Nguyen, H. Y., & Dang, T. D. (2007). Vietnam Red Data Book. Part I. Animals. *Natural Science and Technology Publishing House*.

3. Bourret, R. (1942). Les Batraciens de l'Indochine. Hanoi: Institut Océanographique de l'Indochine.

4. CITES, Convention on international trade in endangered species of wild flora and fauna, www.cites.org, Downloaded on 10 July 2022

5. David, P., Vogel, G., Van Rooijen, J., & Pierre, L. (2011). The name-bearing type of *Oligodon quadrilineatus* (Jan & Sordelli, 1865) (Squamata: Colubridae). *Zootaxa*, 3111(1), 67-68.

6. Glaw, F., & Vences, M. (2007). *A field guide to the amphibians and reptiles of Madagascar*. Vences & Glaw.

7. Forest Protection Department, 2020, <http://www.kiendlam.org.vn> refer to the data of forest changes in December 2020.

8. Frost DR. Amphibian species of the world: An Online Reference, ver. 6.0, American Museum of Natural History, New York. Available from <http://research.amnh.org/herpetology/amphibia/index.pp> (accessed July 2022).

9. Le, D. T., Dao, A. N., Pham, D. T., Ziegler, T., & Nguyen, T. Q. (2018). New records and an updated list of snakes from Yen Bai province, Vietnam. *Herpetology Notes*, 11, 101-108.

10. Nguyen S. L. H., Le D. T., Nguyen T. T. T., (2013). New data on the species composition of herpetofauna in Xuan Son National Park, Phu Tho province. Proceeding of the 5th National scientific conference on Ecology and Biological Resources, 654-659 (in Vietnamese).

11. Nguyen, V. S., Ho, T. C., & Nguyen, Q. T. (2009). Herpetofauna of Vietnam, Edition Chimaira. *Frankfurt am Main, Germany*.

12. P. David, T.Q. Nguyen, T.T. Nguyen, K. Jiang, T.B. Chen, A. Teynié, T. Ziegler, *A new species of the genus Oligodon Fitzinger, 1826 (Squamata: Colubridae) from Northern Vietnam, Southern China and Central Laos*, *Zootaxa*, 2012, 3498, 45-62.

13. Smith M. A., (1943). The Fauna of British India, Ceylon and Burma, Including the Whole of the Indo-Chinese Sub-Region. Reptilia and Amphibia. 3 (Serpentes). Taylor and Francis, London.

14. Teynié, A., & David, P. (2007). Additions to the snake fauna of Southern Laos, with the second Laotian specimen of *Naja siamensis* (Laurenti, 1768) and the first country record of *Oligodon taeniatus* (Günther, 1861) (Squamata, Serpentes). *Russian Journal of Herpetology*, 14(1), 39-44.

15. Tran H. M., Nguyen D. X., Vu P. X., Le H. X., Do T. H., (2008). Biodiversity and conservation of biological resources in Xuan Son National Park, Phu Tho

province. Vietnam Education Publishing House.

16. Tran T. T. (2020). New records and updated composition of reptiles in Xuan Son National park, Phu Tho province. *TNU Journal of Science and Technology* 225(01): 107 – 112.

17. Tran T. T., & Dung L. T. (2019). Four new distributional records of the family Rhacophoridae Hoffman, 1932 in Xuan Son National Park, Phu Tho province. *TNU Journal of Science and Technology* 207(14): 61 – 66.

18. Uetz P, Freed P & Hošek J (eds) (2022). The Reptile Database. <http://www.reptile-database.org> (last access July 2022)

19. Vassilieva A. B. (2015). Herpetodiversity of Xuan Son National Park (Phu Tho province): New

findings. *The Six National Scientific Conference on Ecology and Biological Resources: 392-396 (in Vietnamese, summary in English)*.

20. The Government of Vietnam (2019). The Governmental Decree No. 64/2019/NĐ-CP, dated on 16 July 2019 on Management of Endangered, Precious Flora and Fauna and CITES Enforcement.

21. The Government of Vietnam (2021). The Governmental Decree No. 84/2021/NĐ-CP, dated on 22 September 2021 on Criteria for Identification and Management of Endangered, Precious and Rare Species Prioritized for Protection.

22. IUCN, *The IUCN Red List of Threatened Species*. Version 2022.1,

<http://www.iucnredlist.org>. Accessed on 10 July 2022.

GHI NHẬN MỚI VÀ CẬP NHẬT DANH SÁCH CÁC LOÀI LƯỠNG CƯ BÒ SÁT TẠI TỈNH PHÚ THỌ, MIỀN BẮC VIỆT NAM

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TÓM TẮT

Vườn Quốc gia (VQG) Xuân Sơn, huyện Tân Sơn (tỉnh Phú Thọ) được thành lập theo Quyết định số 49/2002/QĐ-TTg ngày 17/04/2002 với tổng diện tích vùng lõi là 15.048 ha và diện tích vùng đệm là 18.639 ha. Dựa trên kết quả của cuộc điều tra khảo sát thực địa, thu thập mẫu vật Lưỡng cư Bò sát được thực hiện từ tháng 4 đến tháng 10 năm 2019 tại Vườn Quốc gia Xuân Sơn (huyện Tân Sơn), tỉnh Phú Thọ, Việt Nam, kết hợp các mẫu vật mới thu thập được của nghiên cứu này với các loài được ghi nhận trong các công trình công bố của Nguyễn và cộng sự (2009), Nguyễn và cộng sự (2013), Vassiliev A. B. (2015), Trần Thanh Tùng và cộng sự (2019), Trần Thanh Tùng (2020), đã đưa ra danh sách cập nhật 135 loài loài Lưỡng cư Bò sát ở tỉnh Phú Thọ, miền Bắc Việt Nam, bao gồm 49 loài lưỡng cư (thuộc 8 họ), 84 loài bò sát: 10 loài rùa, 21 loài thằn lằn và 53 loài rắn (17 họ). Kết quả của công trình công bố này đã bổ sung cho các nghiên cứu trước đó, bao gồm 1 loài Lưỡng cư (*Ranidae: Odorrana chapaensis*) và ba loài rắn (*Colubridae: Hebius chapaensis, Oligodon albocinctus* và *Oligodon taeniatus*). Ngoài ra chúng tôi cung cấp các mô tả hình thái, thông tin về sự phân bố, sinh thái, sinh cảnh sống của các ghi nhận mới này. Về giá trị bảo tồn, có 04 loài EN, 6 NT, 8 VU, 6 CR được liệt kê trong Sách Đỏ Thế Giới IUCN và một loài thuộc phụ lục IA và 11 loài thuộc phụ lục IIA trong Phụ lục Công ước CITES.

Từ khóa: Lưỡng cư - Bò sát, ghi nhận mới, thành phần loài, tỉnh Phú Thọ.

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